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An attempt is made to judge characteristics affecting a school district's fiscal performance by conducting a factor analysis on 74 variables having factor loadings of .30 or greater. The 16 factors studied (containing the 74 variables) include many facets of school board fiscal policy and information on the kinds of people who make the policies. Two basic conclusions noted are that the board member variable and, to a lesser extent, the equalization of aid variable are influential in determining fiscal responsibility. (HW)

School Board Member Characteristics and Fiscal Responsibility

William S. Vincent • Charles M. Bernardo

The continuing analysis of data in the study of fiscal responsibility of school boards, which has been reported from time to time in these pages,[1] has reached the stage of factor analysis. Before this analysis is reviewed, it should be emphasized that the influence of *fiscal dependence/independence* of school boards does not occur without reference to a variety of other, apparently related, variables. For example, there is a strong indication that fiscal independence is superior to fiscal dependence *if* the school board may operate without a tax limit. In the presence of a tax limit, fiscal dependence is preferable. Furthermore, the available data make it clear that in regard to a measure of *composite fiscal performance* of the school district, a greater portion of the variance is accounted for by the variable *tax limitation/no tax limitation* than by the variable *fiscal dependence/independence*.[2]

There are other indications from the data collected in this study that are less clear but no less tantalizing. For example, in practice state regulations over the local board tend to fall into two patterns. One pattern emphasizes tax limitation, partisanship in school board elections (or appointment of school board members), lack of public vote, coterminousness of the school district with other units of local government and fiscal dependence. The other emphasizes election of school board members, nonpartisanship in elections, no tax limitation, public vote on the budget, non-coterminousness with other units of local government and fiscal independence.[3] Evidence suggests that socio-economic characteristics of school board members are also associated with the two patterns. This latter observation is derived from the factor analysis with which this article is concerned.

Thus we must conclude with James, Kelly and Garms that an optimum method of budget approval, if one exists, does not occur isolated from a variety of other variables which powerfully influence it. As they say:

> . . . how difficult it is to dichotomize all such relationships [i.e. governmental arrangements for budget approval] as fiscal independence or dependence. The real world is more complex. The term "fiscal dependence" is not accurate as a description of a specific set of governmental arrangements.[4]

The real world is always more complex than the scientist's categories for classifying its phenomena. However, it is the function of science to attempt to define and measure the variables which account for differences in the real world. Whatever the variables may be called—which is unimportant—their precise definition makes possible a precise analysis of the results observed when they are present or absent, as defined. For this reason, in the current investigation a functional definition was employed that precisely defines two mutually exclusive categories:

(1) situations where the school budget requires the official approval* of some non-school local governmental agency or any state agency;

(2) situations where the school budget does not require the official approval of any governmental agency other than the school board.

Since it is convenient to retain traditional terms, the former may be designated "fiscal dependence" and the latter "fiscal independence". School districts may be

[1] "New Light on the Size Question," *IAR Research Bulletin*, Vol. 6, No. 2, February, 1966; "Tax Limitation and Fiscal Responsibility of School Boards," Vol. 7, No. 1, November, 1966.

[2] Ibid., Vol. 7, No. 1.

[3] "A Tentative Draft of School Boards Authority and Economic Responsibility," *CSS Special Report*. New York: Central School Boards Committee for Educational Research, October, 1966.

[4] H. Thomas James, James A. Kelly, and Walter I. Garms, *Determinants of Educational Expenditures in Large Cities of the United States*, Cooperative Research Project No. 2389, Stanford, California: School of Education, Stanford University, 1966, p. 84.

* Approval in the strongest sense—i.e. of having the opposite power to reject.

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classified into these categories and other differences among the categories noted. The latter category, of course, includes districts where the public votes on all or part of the budget, *if* the approval of some non-school or non-local governmental agency is not required.

A variety of attendant circumstances accompanies fiscal practice of school districts, qualifying the effect of the dependence/independence variable and overlapping the two principal categories. As James and his colleagues further state:

> The set of variables related to fiscal independence and dependence is extremely complex, and involves interlocking systems of federal, state, local and school district governments, with their accretions of constitutional, charter, and contractual relationships.[5]

It is precisely to illuminate this kind of situation that factor analysis is useful. Variables which are highly intercorrelated are produced in each of the factor lists. Thus one may make some judgment on characteristics that tend to appear simultaneously among the school districts. It may be inferred also that within the total sample of districts there is a group of districts which exhibit to a greater or lesser degree the combination of variables appearing in each of the factors. Thus each factor may be viewed as a set of circumstances which occurs in a set of school districts. One may go further and compute factor scores to determine the degree to which each district in the sample belongs in the set of districts characterized by each factor; this last step has not been taken.

The following discussion deals with the intermediate step mentioned above. Specifically, it attempts a logical interpretation of the factors. In the case of each factor, it advances some assumptions regarding the type of district exhibiting these characteristics.

The factors are listed in the accompanying tables which contain component variables having factor loadings of .30 or greater. In the spirit of logical interpretation each factor is given a title. A principal components factor analysis with verimax rotation was used, embracing 74 variables. In this procedure each variable is correlated with every other variable. The original 117 variables compiled in this study were reduced to 74 to accommodate the task to computer capacity. The number of factors rotated was 16 and the number of iteration cycles was 18. The cumulative proportion of the total variance after 16 rotations was .71.

[5] James, Kelly and Garms, op. cit., p. 81.

Possible Meaning of the Factors

Many facets of school board fiscal policy as well as intimations of the kinds of people who make the policies appear in the data, irrespective of categories of budget approval. The interrelationships occurring in many of the factors confirm the results of previous investigations. This is particularly true of Factor 1. It has been labeled the *wealth and quality factor* because it illustrates as well as any tabular data could that local community wealth influences expenditure which in turn influences salary levels, and that this fiscal progression influences quality.[6] Factor 1 contains virtually all the wealth and expenditure variables among the 74. It contains all the salary variables and most of the "quality related" variables which were included in the study. These latter refer to input measures like *numerical staff adequacy* (professionals per 1000 pupils), *clerical workers per 1000 pupils, percent of staff holding master's and doctor's degrees,* and *guidance counselors per 1000 pupils,* which have been shown to predict output and process criteria of quality.[7]

Factor 1, in addition, includes some socio-economic measures: the *"other"* occupational classification (i.e. non-professional, non-managerial, non-skilled) shows high negative factor loading, as does *percent non-white;* and the relatively high educational attainment of school board members is reflected in the negative loading of *percent that are not high school graduates.* As early as 1938 the high relationship between school quality and educational and occupational measures of the community was shown by Mort and Cornell.[8] In fact, of the five variables yielding highest zero order correlations with the quality criterion three were measures of occupational and educational status of community population. This led to some deterministic feeling at the time that the best way to administer a "good school" was to pick one with the "right" socio-economic conditions. It is noteworthy, however, that Factor 1, though it is the wealth and quality factor, is not "flooded" with "good" socio-economic measures. Wealth appears as a strong conditioner of

[6] For previous investigations of correlations between wealth and expenditure, and wealth and quality criteria, see Donald H. Ross, ed., *Administration for Adaptability.* New York: Metropolitan School Study Council, 1958, Tables pp. 609, 615, 619.

[7] "Patterns of Staff Deployment Related to School Quality," *IAR Research Bulletin,* Vol. 1, No. 3, April, 1961.

[8] Paul R. Mort and Francis G. Cornell, *American Schools in Transition.* New York: Bureau of Publications, Teachers College, Columbia University, 1940.

fiscal performance and quality related input; population characteristics appear much less so. The influence of wealth is great because school revenues in the United States are not sufficiently equalized.[9]

Factor 1: Wealth and Quality†

Maximum Teachers' Salary	.885
Teachers' Salary on Tenth Step with Master's Degree or Equivalent	.880
Beginning Teachers' Salary	.871
Average Teachers' Salary	.843
Percent of School Board Members with "Other" Occupational Classifications	—.760
Effective Buying Income per Capita in 1952	.747
Effective Buying Income per Capita in 1962	.709
Amount Raised Locally per Pupil in Average Daily Attendance in 1942-43	.609
Clerical Workers per 1000 Pupils in Average Daily Attendance	.597
Net Current Expenditure per Pupil in Average Daily Attendance in 1942-43	.582
Percent Non-White Population is of Total Population	—.557
Amount Raised Locally per Pupil in Average Daily Attendance in 1962-63	.510
Effective Buying Income per Capita in 1942	.462
Percent of Total Teaching Staff Holding Master's Degrees	.462
Percent that Summer School Enrollment in Average Daily Attendance is of Average Daily Attendance for Regular School Year	.459
Percent having Adult Education Programs	.426
Percent that District's Average Teachers' Salary is of Average Teachers' Salary for State	.418
Net Current Expenditure per Pupil in Average Daily Attendance in 1962-63	.407
Guidance Counselors per 1000 Pupils in Average Daily Attendance	.386
Percent that Amount Raised Locally for Schools is of Total Local Municipal and School Revenue	.345
Percent of School Board that are not High School Graduates	—.345
Total Local Municipal or General Revenue per Pupil in Average Daily Attendance in 1962	.339
Percent of Total Teaching Staff holding Doctor's Degrees	.328
Percent that College Graduates are of Total Population	.328
Percent that Degreed Teachers are of Total Teaching Staff	.322

Factor 2 is labeled *competitive capability of school boards* because most of the contributing variables relate to *amount raised locally* and the proportion of this that goes to schools relative to the revenues of general government. The other variables in the factor concern the characteristics of the board members; they reveal that low occupational and educational levels of school board members, in combination with increasing municipal revenues, render schools less capable of competing for local and intergovernmental revenues, so that municipal expenditures greatly exceed school revenues. This suggests that in districts which score high on this factor, board members are not of the same level in the power structure as those who preside over the slicing of the local economic pie; furthermore, where this combination of circumstances prevails, the schools take a back seat.

Factor 2: Competitive Capability of School Boards

Percent of School Board Members with "Other" Occupational Classifications	.839
Total Local Municipal or General Revenue per Pupil in Average Daily Attendance in 1962	.834
Percent that State Aid and other Non-Local Aid for Schools are of Total Intergovernmental Revenue for Municipal and School Purposes	—.804
Percent that Amount Raised Locally for Schools is of Total Local Municipal and School Revenue	—.761
Percent that School Expenditures Less Capital Outlay are of Total Municipal and School Expenditure Less Capital Outlay	—.362
Percent of School Board that are not High School Graduates	—.353

Factor 3, which we have called the *low personal income factor,* reflects conditions in small, homogeneous (*low non-public school enrollment*), rural communities of low personal income, low wealth and, consequently, high state aid. Indications of this are the high loadings of occupational classifications of "other", retired, service workers, housewives, farmers, semi-skilled and unskilled workers.

Factor 3: Low Personal Income

Percent of School Board Members with Occupational Classification of Service Workers	.880
Percent of School Board Members with Occupational Classification of Retired	.837
Number of School Board Members	—.784
Percent of Ex-Officio Members on School Board	.685
Percent of School Board Members with "Other" Occupational Classifications	.614
Percent of School Board Members with Occupational Classification of Semi-Skilled Operatives and Unskilled	.466
Percent of School Board Members with Occupational Classification of Housewives	.452
Number of Special Committees	—.403
Percent of School Board Members with Occupational Classification of Sales and Clerical Personnel	.379
Percent that Non-Public School Enrollment is of Total k-12 Enrollment	—.378
State Aid per Pupil in Average Daily Attendance in 1942-43	.341
Percent of School Board Members with Occupational Classification of Farmers	.304

In Factor 4, *rising expenditure* reflects success in economic competition. Thus, many schools have been able to compete successfully with other elements in the economy. However, we see here that the primary factor associated with the capacity to compete is not wealth. In fact, none of the growth indices—measures of im-

[9] *IAR Research Bulletin,* Vol. 7, No. 1, Figure and p. 4.
† Each factor will be followed by a listing of component variables with factor loadings.

provement from 1942 to 1962—appear in the wealth and quality Factor 1. What is associated in Factor 4 are (1) a school board member occupational characteristic, and (2) a capacity to solve capital program problems as revealed by *percent of operational buildings on double sessions* (negative).

Factor 4: Rising Expenditure

Percent of School Board Members with Occupational Classification of Semi-Skilled Operatives and Unskilled Workers	—.770
Growth Index of Net Current Expenditure per Pupil in Average Daily Attendance from 1942-43 to 1962-63	.549
Number of Standing Committees	—.414

Current budget versus capital and debt is the substance of Factor 5. The high loading and opposite sign show that certain districts are forced to choose between financing the educational program or the building program. *Net current expenditure* is negatively related to capital outlay and debt service. It is interesting that one of the quality related input measures appears in this factor: *library and audio-visual aids expenditure per pupil.* This indicates that, in general, the stocking of libraries and film depots occurs when the building is new and that original expenditures for such purposes exceed any later outlays for expansion or renovation.

Factor 5: Current Budget Versus Capital and Debt

Debt Service Expenditure per Pupil in Average Daily Attendance in 1962-63	.990
Library and Audio-Visual Aids Expenditure per Pupil in Average Daily Attendance in 1962-63	.912
Net Current Expenditure per Pupil in Average Daily Attendance in 1962-63	—.902
Capital Outlay Expenditure per Pupil in Average Daily Attendance in 1962-63	.634
Net Current Expenditure per Pupil in Average Daily Attendance in 1942-43	—.457

Diminishing wealth results in diminishing revenue, says Factor 6, in states where equalization of aid is not sufficient to cope with the problems of variability in wealth. Evidence for this is the fact that state aid, as well as local revenue, declines as wealth declines in school districts which exhibit these conditions.

Factor 6: Diminishing Wealth-Revenue

Growth Index of Effective Buying Income per Capita from 1942 to 1962	—.947
State Aid per Pupil in Average Daily Attendance in 1962-63	—.847
Effective Buying Income per Capita in 1942	—.806
Assessed or True Valuation per Pupil in Average Daily Attendance in 1962-63	—.708
Amount Raised Locally per Pupil in Average Daily Attendance in 1962-63	—.676

Factor 7 is a rural factor, as the occupational variables attest, but it differs from Factor 3, also indicative of rurality, principally in the matter of state aid. Districts which exhibit a high factor score on Factor 7, it is surmised, are in states where equalization is not a prominent factor in the aid formula. The opposite is the case for districts that score high on Factor 3.

Factor 7: Unequalized Rural

Percent of School Board Members with Occupational Classification of Skilled Craftsmen, other Skilled Workers, and Foremen	—.796
State Aid per Pupil in Average Daily Attendance in 1942-43	—.632
Percent of School Board Members with "Other" Occupational Classifications	—.529
Percent of School Board Members with Occupational Classification of Farmers	.496
Percent of School Board Members with Occupational Classification of Service Workers	.437
State Aid per Pupil in Average Daily Attendance in 1962-63	—.333
Percent that Amount Raised by Property Tax is of Total Local Municipal or General Revenue	.302

Factor 8 is *equalization in action.* In districts where this combination of circumstances obtains, wealth declined over the ten-year period from 1952-62, and the percent of non-white population increased. All other variables (except the positive loading on *farmers as board members*) are quality-related input variables. In these fortunate districts the means are made available for staffing the schools more in accordance with the needs of their (presumably) depressed communities. These data, it should be noted, precede the inauguration of programs like Head Start.

Factor 8: Equalization in Action

Librarians per 1000 Pupils in Average Daily Attendance	.645
Growth Index of Effective Buying Income per Capita from 1952 to 1962	—.607
Percent of Total Teaching Staff Holding Doctor's Degrees	.522
Teachers per 1000 Pupils in Average Daily Attendance	.413
Percent of School Board Members with Occupational Classification of Farmers	.405
Percent that Non-White Population is of Total Population	.389
Guidance Counselors per 1000 Pupils in Average Daily Attendance	.383

Among some districts a wealth disadvantage results in larger classes (teachers per 1000 pupils), and in districts where the circumstances of Factor 9 dominate, the policy is to employ teachers who have had minimal preparation. Districts exhibiting these circumstances are low in number of staff as well as in preparation of staff.

Factor 9: Low Staff

Percent of Total Teaching Staff Holding only Bachelor's Degrees	.802
Percent that Degreed Teachers are of Total Teaching Staff	.614
Teachers per 1000 Pupils in Average Daily Attendance	—.487
Effective Buying Income per Capita in 1962	—.404
Effective Buying Income per Capita in 1952	—.390
Number of Standing Committees	—.323

Factor 10 suggests that some schools are characterized by high occupational and educational attainment of their board members, irrespective of their communities' wealth.

Factor 10: High Socio-Economic Status of Board

Percent of School Board that are High School Graduates but not College Graduates	—.832
Percent of School Board that are College Graduates	.721
Percent of School Board Members with Occupational Classification of Professional and Technical Services	.482
Growth Index of Other Aid per Pupil in Average Daily Attendance from 1942 to 1962	—.357
Percent of School Board Members with Occupational Classification of Skilled Craftsmen, other Skilled Workers, and Foremen	—.346
Percent of School Board Members with Occupational Classification of Sales and Clerical Personnel	—.332

We have called Factor 11 the *medium-size factor* for no particular reason other than that it obviously reflects neither rural nor big city conditions. The calibre of school board members as measured by occupational status is not high.

Factor 11: Medium Size City

Specialists from Other Agencies per 1000 Pupils in Average Daily Attendance	—.723
Percent of School Board Members with Occupational Classification of Semi-Skilled Operatives and Unskilled Workers	.709
Degree to which School Board Meetings other than Closed Executive Sessions are Open to the Public	.504
Ratio of Utility Expenditures to Utility Revenue	.441
Percent of School Board Members with Occupational Classification of Skilled Craftsmen, other Skilled Workers, and Foremen	.330

Factor 12 characterizes schools that have slipped badly in the economic competition, as attested by the high negative loading on *growth index of amount raised locally*. Coupled with a similar high negative loading on *growth index of state aid,* it is quite evident that districts scoring high on this factor would be in bad shape indeed. Irrespective of other conditions that may prevail, board members are from low income groups.

Factor 12: Economic Decline

Growth Index of Amount Raised Locally per Pupil in Average Daily Attendance from 1942 to 1962	—.944
Growth Index of State Aid per Pupil in Average Daily Attendance from 1942 to 1962	—.941
Amount Raised Locally per Pupil in Average Daily Attendance in 1942-43	—.517
Percent of School Board Members with Occupational Classification of Semi-Skilled Operatives and Unskilled Workers	.368

We have called Factor 13 the *small items expenditure factor* because the highest loadings are on two variables concerned with such expenditures. So-called "small items expenditures" and their relation to quality were first investigated by Brickell,[10] and later by Teresa[11] and Campbell.[12] Their work, which was not conclusive, suggested that the relatively small budget allocation for teaching materials (principally textbooks, library resources and audio-visual aids, but including other materials and supplies) is predictive of quality. Relatively small sums appeared to have great leverage. In Factor 13, the single variable related to small items expenditures stands almost alone. The only variables appearing with it concern characteristics of school board members, which suggests that policies of "giving teachers the tools to work with" are intimately associated with the kind of board members in the school district.

Factor 13: Small Items Expenditure

Growth Index of Library and Audio-Visual Aids Expenditure per Pupil in Average Daily Attendance from 1942 to 1962	—.858
Library and Audio-Visual Aids Expenditure per Pupil in Average Daily Attendance in 1942	—.793
Percent of School Board Members with "Other" Occupational Classifications	.637
Percent of School Board Members with Occupational Classification of Service Workers	—.371
Percent of School Board that are not High School Graduates	—.343
Percent of School Board Members with Occupational Classification of Retired	—.314

In Factor 14 there is a combination of circumstances which clearly indicates a type of community where people of high socio-economic status have brought their own non-skilled and service help into the population (*percent non-white*). *Percent white collar workers, percent college graduates, percent buying income per capita* are all measures originally uncovered by Mort and Cornell as predictive of "highly favored" community settings for schools.[13]

Factor 14: High Status Suburban Community

Percent that White Collar Workers are of Total Population	.826
Percent that College Graduates are of Total Population	.720

[10] Henry M. Brickell, "An Analysis of Certain Non-Instructional-Staff Expenditures." New York: Unpublished Ed.D. Project, Teachers College, Columbia University, 1953.

[11] Anthony J. Teresa, "An Analysis of the Effect of Various Specific Items in School Accounts." New York: Unpublished Ed.D. Project, Teachers College, Columbia University, 1955.

[12] James Allan Campbell. "Small Item Expenditure and School Quality—A Cost-Quality Study." New York: Unpublished Ed.D. Project, Teachers College, Columbia University, 1956.

[13] Mort and Cornell, op. cit.

Percent of School Board that are not High School Graduates	—.397
Percent of School Board Members with "Other" Occupational Classifications	—.377
Effective Buying Income per Capita in 1962	.358
Percent that Non-White Population is of Total Population	.326
Percent of School Board that are College Graduates	.316

High proportions of managers and officials on the school board tend to cluster with lower percentages of professionals and farmers on the board. This combination of variables, seen in Factor 15, is accompanied by a favorable competitive average teachers' salary in the district relative to the state's average. This indicates the situation, common in so many states, of a single city of several hundred thousand people holding all of the state's economic trumps.

Factor 15: Middle Class, Middle-Size City

Percent of School Board Members with Occupational Classification of Managers, Officials, and Business Owners (except Farmers)	.787
Percent of School Board Members with Occupational Classifications of Professional and Technical Services	—.472
Percent of School Board Members with Occupational Classification of Farmers	—.404
Percent that District's Average Teachers' Salary is of Average Teachers' Salary for State	.374
Ratio of Utility Expenditures to Utility Revenue	.356
Percent of Total Teaching Staff Holding only Master's Degrees	.321

It would be difficult to propose any logical accounting for Factor 16, except in relation to some peculiar type of school district. This possibility revolves around the peculiar shift in sign in *other aid* from 1942-43 to 1962-63, and the uncertain methods of selecting school board members.

Factor 16: Peculiar Situation

Other Aid, including Federal Funds, per Pupil in Average Daily Attendance in 1942-43	.695
Percent of School Board Members with "Other" Occupational Classifications	.550
Other Aid, Including Federal Funds, per Pupil in Average Daily Attendance in 1962-63	—.508
Average Number of Different Methods of Nomination for Election to School Board	.482
Percent of School Board Members with Occupational Classification of Retired	—.372
Percent of School Board Members with Occupational Classification of Service Workers	.332
Percent of School Board Members with Occupational Classification of Skilled Craftsmen, other Skilled Workers and Foremen	.327

Overall Indications

Throughout the examination of these factors one can hardly fail to note the persistence of variables relating to characteristics of school board members. Of the 74 variables submitted to the factor analysis, 65 appeared in the factors with a loading above 30, and although only 18 of these 65 relate to school board members, these 18 appear time and again—in no less than 13 of the 16 factors. There are places, in fact, where we can view specific policies in some relation to school board members. The clearest example of this is in Factor 13. But note also in Factors 2, 4 and 12 how a certain fiscal policy seems related to the position of board members in the community power structure. Factor 10 is actually a description of some of the essential attributes of a highly competent board.

A basic conclusion from this factor analysis is, in short, that the "board member variable" (perhaps as a function of the manner of selection) can take its place with the other principal influences, discussed above, derived from state law and regulation.

Another such influence appears to be equalization of aid. Although no actual measure of degree of equalization was obtained in this study, combinations of other variables point distinctly to the likelihood that equalization—or the lack of it—has a fundamental influence on the fiscal well-being of school districts. Factor 3, for example, exhibits a healthy combination of conditions because of equalization in aid, whereas Factor 7 shows an unhealthy state of affairs. Factor 8 displays some of the consequences of equalization, Factor 9 what happens when equalization is minimal and Factor 6 the situation when local wealth declines in the absence of adequate equalization. Factor 12 combines variables that attest to the complete breakdown of the equalization principal.

It is an interesting exercise to divide the factors into "favorable—unfavorable", "wholesome—unwholesome" or "good—not-so-good" dichotomies. One favors the combination of variables revealed in Factors 1, 3, 4, 8, 10, 14 and 15, but is not so impressed by Factors 2, 5, 6, 7, 9, 12 and 13; one has feelings neither way about Factors 11 and 16. So in less than half the instances could one discuss with any confidence "what's right with the schools!"

Thus we see that numerous methods of examining data yield many more insights than a single statistical treatment can reveal. In the process, the family of probable major influences on wholesome school district organization and operation gradually extends its lineage.

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